## 1.1 INTRODUCTION

First of all, thank you for purchasing MX3 series 2+1 mini redundant power supply.

The MX3 series is a 2+1 hot-swappable / hot-pluggable redundant power supply. It consists of,

1) complete metal frame
2) compact size power module
3) backplane

It is composed of 2+1 pieces power modules. The number 2+1 stands for there is an extra power module to backup the system if any power module fails.

The power module is in compact size, and built-in a 40mm ball bearing DC fan. Particularly, a 80mm DC fan is built unto the rear side of the power system to offer better ventilation and reliability (not available for MX3 series). Each power module is designed with 6 outputs (+3.3V, +5V, +12V, -5V, -12V, and +5Vsb) circuits, and compliant to ATX12V / EPS12V. All you can see on the backplane is just passive components and this is the key point for longer MTBF.

The MR3 series offer a warning sub-system, including LED display, buzzer alarm, TTL signal, and $I^2C$ interface device (optional). It guides user the fast way to find out the power supply status.

When all the power modules operate normally, it balances the load share through its parallel design, which increases the reliability of power system.

To really discover the power system and ease in using it, we recommend you to read through this manual carefully.

## 1.2 PACKING

Your MX3 series should consist of the following,

a) MX3 series x 1
b) Accessory pack x 1
c) Product Manual x 1

## 1.3 MODEL DESINGATION

Model number identification

MX3 – 6550P / 6600P

MX3 --- 2+1 mini redundant power supply, AC input
6 --- 6 output channel (+3.3V, +5V, +12V, -5V, -12V & +5Vsb)
550 / 600 --- total output power (unit: watts)
P --- built-in PFC (full range)

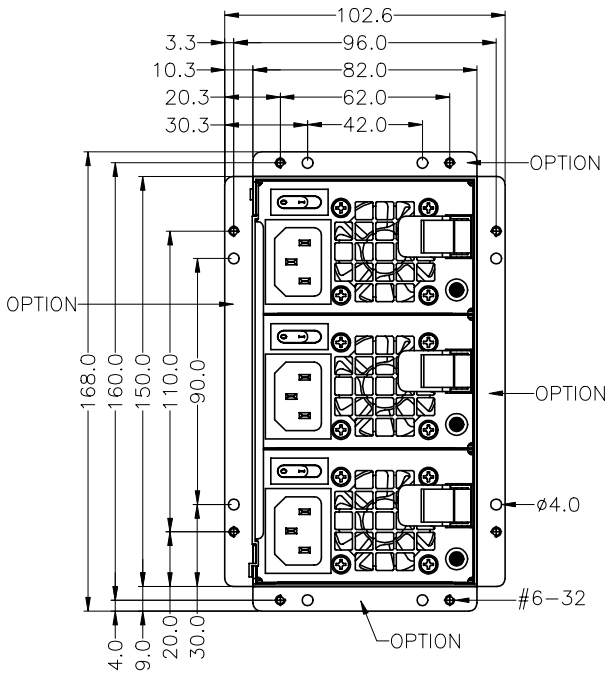
## 1.4 FEATURES

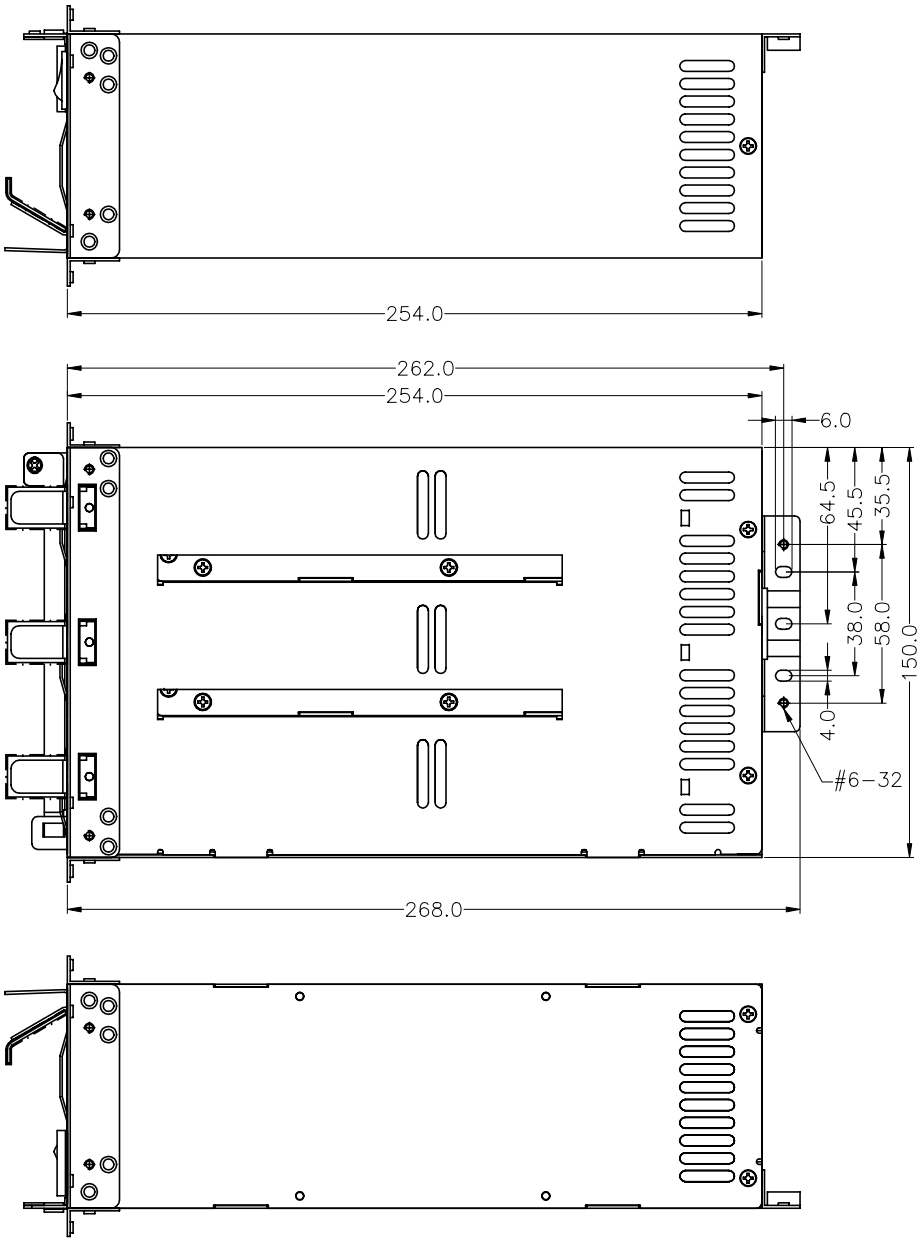
MX3 series, 550W / 600W, 2+1 redundant power supply with active PFC, complaint to ATX12V / EPS12V

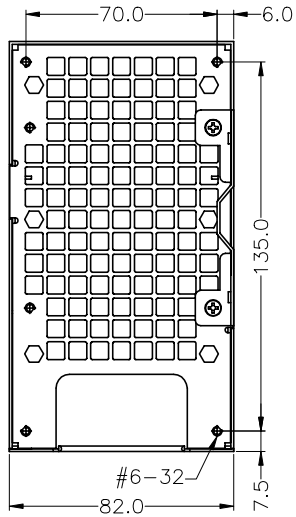
- True redundant design (passive packplane)
- N+1 power system design
- All circuit designed into the power module
- Hot-swap and hot-plug ability
- Full range (90VAC – 264VAC) operation
- Active Power Factor Correction (PFC) built-in
- Balance load sharing design
- Remote sensing design
- Meet FCC, CISPR EMI regulation
- Faulty free- slide rail design
- Smart $I^2C$ interface design (optional)
- Dual EMI line filter inlets design
- Designed with one 40mm ball bearing DC fan on power module
- An 80mm ball bearing DC fan on the rear side of power system (not available for MX3 series)

## 1.5 DRAWING

| 修訂 REVISIONS | | |
|---|---|---|
| 版次 REV. | 記述 DESCRIPTION | 日期 DATE |
| A2 | 配合客戶需求修改尺寸 | JUL-16-2003 |
| A3 | 設計變更 | SEP-13-2004 |




TOLERANCES:±0.5mm

| | | | |
|---|---|---|---|
| 容許公差: TOLERANCES: .XXX ±.025 .XX ±.100 .X ±.250 | 材料規格: MATERIAL: | | 新巨企業股份有限公司 ZIPPY TECHNOLOGY CORP. POWER DIVISION |
| | 核准者: APPROVE BY: | 日期: DATE: | 品名: MODEL NO: MX3 外觀尺寸圖 |
| 投影法: PROJECTION: 第三角法 | 審核者: CHECK BY: | 日期: DATE: | 料號: PART NO: |
| | 繪圖者: DRAW BY: | 日期: DATE: SEP-13-2004 | 圖號: DRAW NO: MX30MA00 檔號: FILE NO: MX30MA00 |
| | | | 單位: UNITS: mm 版次: REV. NO: A3 規格: SPEC.: A1 編號: SHEET: OF |

## 1.6 SPECIFICATION

**INPUT CHARACTERISTICS: MX3-5750P**

- VOLTAGE: 90 ~ 264 VAC FULL RANGE
- FREQUENCY : 47 ~ 63 Hz
- INPUT CURRENT: 13 / 6.5 A FOR 115 / 230 VAC
- INRUSH CURRENT: 80A / 100A MAX. FOR 115 / 230 VAC PER POWER MODULE

**OUTPUT CHARACTERISTICS:**

| OUTPUT VOLTAGE | OUTPUT CURRENT | | | REGULATION | | OUTPUT |
|---|---|---|---|---|---|---|
| | MIN.[A] | MAX.[A] | PEAK(A) | LOAD | LINE | RIPPLE & NOISE MAX. [P-P] |
| 5V | 3.0 | 52 | | ± 5% | ± 1% | 50mV |
| 12V | 2 | 56 | | ± 5% | ± 1% | 120mV |
| -12V | 0.1 | 1 | | ±10% | ± 1% | 120mV |
| 3.3V | 1.0 | 40 | | ± 5% | ± 1% | 50mV |
| +5VSB | 0.1 | 2.5 | | ± 5% | ± 1% | 50mV |

REMARKS: TOTAL CURRENT OF +5V AND + 3.3V NOT EXCEED 80 A

- TEMPERATURE RANGE : OPERATING $0^0$C --- $40^0$C, STORAGE –$20^0$C --- $80^0$C
- HOLD UP TIME: 16 ms MINIMUM AT FULL LOAD & 90 VAC INPUT VOLTAGE
- DIELECTRIC WITHSTAND: INPUT / OUTPUT 3000 VAC FOR 1 MINUTE
  INPUT TO FRAME GROUND 1500 VAC FOR 1 MINUTE
- EFFICIENCY: 63% TYPICAL, AT FULL LOAD
- POWER GOOD SIGNAL: ON DELAY 100 ms TO 500 ms, OFF DELAY 1 ms
- OVER LOAD PROTECTION: 110 ~ 160% MAX.
  OVER VOLTAGE PROTECTION:
  **+5V → 5.7V ~ 6.7V, 3.3V → 3.7 ~ 4.7V, 12V → 13.0 ~ 15.0V**
- EMI NOISE INLET FILTER: FCC CLASS B, CISPR22 CLASS B
- SAFETY: MEET UL 60950, CSA 22.2 60950, TÜV EN-60950,CB IEC60950
- REMOTE ON / OFF CONTROL
- FAULTY ALERT METHODS : LED, BUZZER, TTL SIGNAL
- HOT-SWAPPABLE / HOT-PLUGGABLE REDUNDANCY FUNCTION
- 2 + 1 BALANCE LOAD SHARING DESIGN ON 5/12/3.3V CHANNEL
- REMOTE SENSING DESIGN
- ISOLATION: BUILT-IN IN THE POWER MODULE
- MEET IEC-1000-3-2 CLASS D ( ACTIVE PFC )
- DIMENSION: 84(H) X 150(W) X 265 (D) mm
- COOLING : THREE 40 mm DC FANS ( ONE IN EACH MODULE )
- AC INLET BUILT IN EACH MODULE

## INPUT CHARACTERISTICS: MX3-6550/6600P

- VOLTAGE: 90 ~ 264 VAC FULL RANGE
- FREQUENCY: 47 ~ 63 Hz
- INPUT CURRENT: 9.0 / 5 A FOR 115 / 230 VAC
- INRUSH CURRENT: 80A / 100A MAX. FOR 115 / 230 VAC PER POWER MODULE

## OUTPUT CHARACTERISTICS:

| OUTPUT VOLTAGE | OUTPUT CURRENT | | | REGULATION | | OUTPUT |
|---|---|---|---|---|---|---|
| | MIN.[A] | MAX.[A] | PEAK(A) | LOAD | LINE | RIPPLE & NOISE MAX. [P-P] |
| 5V | 3.0 | 60 | | ± 5% | ± 1% | 50mV |
| 12V | 2 | 40 | | ± 5% | ± 1% | 120mV |
| -5V | 0.1 | 1 | | ±10% | ± 1% | 120mV |
| -12V | 0.1 | 1 | | ±10% | ± 1% | 120mV |
| 3.3V | 1.0 | 36 | | ± 5% | ± 1% | 50mV |
| +5VSB | 0.1 | 2.5 | | ± 5% | ± 1% | 50mV |

REMARKS: TOTAL CURRENT OF +5V AND + 3.3V NOT EXCEED 70 A

TOTAL +5V AND 3.3V AND 12V POWER NOT EXCEED 520 / 570 W

- TEMPERATURE RANGE : OPERATING $0^0$C --- $40^0$C, STORAGE –$20^0$C --- $80^0$C
- HOLD UP TIME: 16 ms MINIMUM AT FULL LOAD & 90 VAC INPUT VOLTAGE
- DIELECTRIC WITHSTAND: INPUT / OUTPUT 1500 VAC FOR 1 MINUTE
  INPUT TO FRAME GROUND 1500 VAC FOR 1 MINUTE
- EFFICIENCY: 63% TYPICAL, AT FULL LOAD
- POWER GOOD SIGNAL: ON DELAY 100 ms TO 500 ms, OFF DELAY 1 ms
- OVER POWER PROTECTION: 110 ~ 160% MAX.
  OVER VOLTAGE PROTECTION:
  **+5V → 5.7V ~ 6.7V, 3.3V → 3.7 ~ 4.7V, 12V → 13.0 ~ 15.0V**
- EMI NOISE INLET FILTER: FCC CLASS B, CISPR22 CLASS B
- SAFETY: MEET UL 1950, CSA 22.2 NO/ 950, TÜV IEC 950
- REMOTE ON / OFF CONTROL
- FAULTY ALERT METHODS : LED, BUZZER, TTL SIGNAL
- HOT-SWAPPABLE / HOT-PLUGGABLE REDUNDANCY FUNCTION
- 2 + 1 BALANCE LOAD SHARING DESIGN ON 5/12/3.3V CHANNEL
- REMOTE SENSING DESIGN
- ISOLATION: BUILT-IN IN THE POWER MODULE
- MEET EN61000-3-2 CLASS D ( ACTIVE PFC )
- DIMENSION: 82(H) X 150(W) X 254 (D) mm
- COOLING : THREE 40 mm DC FANS ( ONE IN EACH MODULE )
- AC INLET BUILT IN EACH MODULE

## 1.7 INSTALLATION & TESTING

Mount the power supply into the system chassis by using proper mounting tool. The mounting holes of the power supply should match up with those in the chassis. Connect the power connectors to the M/B by following the M/B instruction. There is various on connectors / pinouts in both power supply and M/B. Please ensure to connect the matched one; otherwise, it will cause unexpected harms.

Connect the remaining power connectors to the various peripherals as needed. These connectors are “keyed”, so there will be only one possible way to connect them.

Before applying power source to the system, make sure these is no loosed or incorrect connectors. Double check if all connection to the M/B is matched properly. Maybe you would like to test the redundancy function before you put back the cover of your system chassis, then, please power it on. If the power system operates normally, the individual LEDs on power module and the external warning LED light in GREEN. Now, remove one power module from the power system, the warning buzzer in the power system will sound, the external warning LED, which displays the status of the total power system, will become blinking, the individual LED indicating the power module’s status will distinguish. Meanwhile, the power system will continue to backup the power output without affecting the operation of your computing system.

The warming buzzer will sound continuously. You can reset warning buzzer by pressing the buzzer reset switch. Insert the power module which is removed for test earlier. The sound of the warning buzzer will stop; the external warning LED will turn to be GREEN again; the LED indicating the status of power module will light in GREEN. Test another power supply by performing the same procedure.

If everything works out fine, then turn off the power system. Now put back the cover of the chassis and tighten with the screws which you have retained earlier. Now you have completed the installation of MR3 series redundant power supply.

## 1.8 Hot-swap procedures

Please refer to the following when either power module is defective.

1) Locate the defective power module by examining the individual LED (if LED is distinguished, it indicates the power module is defective).

*** WARNING:

*Please perform the following step carefully; otherwise, it may cause the whole system shutdown.*

*** WARNING:

*Please do not remove the defective power module until you have worn gloves to keep from been burned. This is due to the cover of the power module is used as heat sink for cooling. Usually, its temperature is around 50-60 degree Celsius under full load condition.*

2) Loose the screws of power module bracket.
3) Plug out the defective power module.

*** WATNING:

*Please put aside the power module to wait for cooling down. Keep other people from toughing it until it is cooled.*

4) Replace a new / GOOD power module. Insert the power module into the power system till to the end.
5) Check the LED of the power module, which should be in GREEN.
6) Check the warning LED indicating the status of total power system, which should be in GREEN.
7) Tighten the screws of the power module.
8) If you want to test this new power module and simulate the defective situation, please refer to Section 1.7 Installation & Testing.

*Remarks: If the DC fan of the power module fails, you have to replace the power module. Please follow the Hot-Swap Procedures for replacement.*

## 1.9 PINOUTS AND FUNCTION OF THE CONNECTORS

THE LED CONNECTOR OF TOTAL POWER SYSTEM

| PIN# | COLOR |
|---|---|
| 1 | RED |
| 2 | BLACK |
| 3 | GREEN |

THE BUZZER RESET SWITCH CONNECTOR

| PIN# | COLOR |
|---|---|
| 1 | BLACK |
| 2 | YELLOW |

THE SIGNAL CONNECTOR OF POWER RESET

| PIN# | COLOR | COLOR |
|---|---|---|
| 1 | RED | TTL SIGNAL |
| 2 | BLACK | GND |

TTL signal:

Sink current max. 5mA

Source current max. 50uA

Low Active ---Defective

High ---Normal

## 1.10 TROUBLE SHOOTING

If you have followed these instructions correctly, it should function normally.

Some common symptoms are, the system doesn't work, buzzer alarms, shutdown after running a very short period,…etc. If so, please check the following steps to verify and correct it.

1) Check all connection (if pinouts is correct, if any connection loosed, if the direction is incorrect,…etc.).

2) Check if any short-circuit or defective peripherals by plugging out the power connector from each peripheral, one at a time. Shall the system functions again, you have solved the problem.

3) Once you hear the buzzer sound or see the warning LED become blinking, please check,

   a) If the loading is under the minimum or over the maximum load of each channel.
   b) If the power source is well connected and supplied.

   Shall the above condition is happened, please disconnect the power source and wait for 2-3 minutes to release the protection status; then test it again.

   c) If buzzer keeps alarming or LED indicates the power module failure, please locate which power module is defective. Perform hot-swap procedures (ref. to Sec. 1.8 Hot-Swap Procedures). Return the defective power module back to your vendor for RMA procedure.
   d) If you can not fix the problem, please contact your vendor for supporting.

Note:

* The description stated herein is subject to change without prior notice.

- All brand names and trademarks are the property of their respective owners.